IN THE CLAIMS:

1. **(Previously Presented)** In a network that carries traffic of a plurality of sessions, a method, carried out by one of said sessions, comprising the steps of:

evaluating a session congestion measure that is related to congestion information on links of said network which carry incoming traffic to a receiving end of said session;

evaluating a session incremental reward function that is related to rate of said incoming traffic, and to traffic rate of no other session;

evaluating a new rate of said incoming traffic that moves said rate of said incoming traffic in a direction that minimizes a global network cost function which combines cost functions assigned to said sessions and congestion cost functions assigned to said links.

2. **(Previously Presented)** The method of claim 1 where said session incremental reward function is the negative of a derivative, with respect to rate of said incoming traffic, of said one of said cost functions assigned to said sessions.

3. **(Original)** The method of claim 1 where said session congestion measure is a derivative, with respect to said rate of said incoming traffic, of a sum of congestion cost functions assigned to links employed by said session.

4. **(Previously Presented)** The method of claim 1 where said congestion cost function assigned to a link attributes a very large cost for link loads in excess of a selected threshold, chosen as maximum permissible link load.

5. **(Original)** The method of claim 1 where said new rate is an incremental change from said rate of said incoming traffic of said session, where the incrementing is determined based on said session incremental reward function and said session congestion measure.

6. **(Original)** The method of claim 1 where said step of evaluating a new rate is carried out at a receiving end of said session, and said method further comprises a step of

communicating information to a sending end of said session, to change said rate of said incoming traffic towards said new rate.

7. **(Original)** The method of claim **1** where said step of evaluating a new rate is carried out at a sending end of said session and includes a step of receiving at said sending end results of said step of evaluating said session congestion measure

8. **(Original)** The method of claim **5** where said new rate developed is an incremental change arrived at through an additive factor.

9. **(Original)** The method of claim **8** where said new rate, r_s, is determined based on an auxiliary parameter, $\hat{r}_s = r_s + \mu \cdot (h_s(r_s) - \gamma_s(\mathbf{f}))$, where μ is a multiplicative step size coefficient, r_s is an assigned rate of incoming traffic at time of said evaluating, $h_s(r_s)$ is said session incremental reward function, and $\gamma_s(\mathbf{f})$ is said session congestion measure.

10. **(Original)** The method of claim **9** where said new rate, r_s, is determined by

$$r_s \leftarrow \hat{r}_s \quad \text{if} \quad r_s^{init} \le \hat{r}_s \le r_s^d$$

$$r_s \leftarrow r_s^{init} \quad \text{if} \quad \hat{r}_s \le r_s^{init}$$

$$r_s \leftarrow r_s^d \quad \text{If} \quad r_s^d \le \hat{r}_s,$$

where $r_s^{init} \ge 0$.

11. **(Original)** The method of claim **8** where said new rate, r_s, corresponds to the larger of r_s^{init} or $\tilde{r}_s + \mu \cdot (h_s(\tilde{r}_s) - \gamma_s(\mathbf{f}))$, where r_s^{init} is a given initial rate that is greater or equal to 0, μ is a multiplicative step size coefficient, $\tilde{r}_s$ is an attained average rate of incoming traffic at time of said evaluating, $h_s(\tilde{r}_s)$ is said session incremental reward function, and $\gamma_s(\mathbf{f})$ is said session congestion measure.

12. **(Original)** The method of claim **1** where said session incremental reward function is a positive, decreasing, function with respect to session rate.

13. **(Currently Amended)** <u>In a network that carries traffic of a plurality of sessions, a method, carried out by one of said sessions, comprising the steps of:</u>

<u>evaluating a session congestion measure that is related to congestion information on links of said network which carry incoming traffic to a receiving end of said session;</u>

<u>evaluating a session incremental reward function that is related to rate of said incoming traffic, and to traffic rate of no other session;</u>

<u>evaluating a new rate of said incoming traffic that moves said rate of said incoming traffic in a direction that minimizes a global network cost function which combines cost functions assigned to said sessions and congestion cost functions assigned to said links</u>

~~The method of claim 1~~ where said session incremental reward function is a positive, decreasing, function with respect to session rate, starting at a minimum session rate, $r_s^{\min} \geq 0$, where the incremental reward function is a very large value at $r_s = r_s^{\min}$.

14. **(Original)** The method of claim **1** where a derivative of each of said link cost functions is a positive, increasing function with respect to rate of traffic on the link.

15. **(Original)** The method of claim 1 where a derivative of each of said link cost function is a positive, increasing, function of an average queue length in said link.

16. **(Original)** The method of claim 1 where the derivative of the congestion cost function for a link of said network is defined by $g_l'(f^l) = \frac{1}{(1-\eta^l/\eta_o^l)^\upsilon}$,

where υ is a positive constant, f^l is the average traffic flow rate at link l, and η^l is the average queue length in link l.

17. **(Original)** The method of claim **1** where said session incremental reward function, h_s, corresponds to $\left(\frac{\alpha_s}{r_s}\right)^{\upsilon_s}$, where α_s and υ_s are selected positive constants.

18. **(Original)** The method of claim **17** where different ones of said plurality of sessions employ different values of υ_s.

19. **(Original)** The method of claim **17** where different ones of said plurality of sessions employ different values of υ_s to achieve different levels of priority.

20. **(Original)** The method of claim **1** where said second incremental cost, h_s, corresponds to $h_{\max}\frac{\eta_s}{\eta_s + r_s^{\upsilon_s}}$, where $h_{\max}$, η_s, and υ_s are selected constants for each of said sessions.

21. **(Original)** The method of claim **1** where said incoming traffic comprises packets, and all packets of said incoming traffic of said session traverse the same path that includes a given subset of links of said network.

22. **(Original)** The method of claim **21** where said new rate is incrementally changed from said rate of said incoming traffic of said session, where the incrementing is related to said session incremental reward function and said session congestion measure, $\gamma_s(\mathbf{f})$, defined by $\gamma_s(\mathbf{f}) = \sum_{l \in P_s} g_l'(f^l)$, where P_s is said subset of links, and $g_l'(f^l)$ is the derivative of said session congestion cost function of link l.

23. **(Currently Amended)** The method of claim **1** where said incoming traffic <u>of a session</u> comprises packets where some of said packets traverse one subset of links of said network, and at least some others of said packets traverse a different subset of links.

24. (Original) The method of claim **23** where said new rate is incrementally changed from said rate of said incoming traffic of said session, where the incrementing is related to said session incremental reward function and said session congestion measure, $\gamma_s(\mathbf{f})$, defined by $\gamma_s(\mathbf{f}) = \sum_{l=1}^{L} \varphi_s^l \cdot g_l'(f^l)$, where φ_s^l corresponds to a fraction of said packets of said incoming traffic that flows through link l, and $g_l'(f^l)$ is the derivative of said congestion cost function of link l.

25. (Original) The method of claim **1** where said incoming traffic originates at a sending end, and said sending end includes in said incoming traffic probe packets that include at least one congestion field that is modified by network nodes through which said probe packets traverse.

26. (Original) The method of claim **25** where said probe packets are transmitted by said sending end at regular intervals.

27. (Original) The method of claim **26** where said probe packets also carry information for said receiving end.

28. (Original) The method of claim **25** where each of said nodes through which a probe packet traverses, updates a first one of said congestion fields based on a current estimate of the incremental cost, $g_l'(f^l)$, of a link through which said probe packet leaves said node.

29. (Original) The method of claim **25** where each of said nodes through which a probe packet traverses increments a first one of said congestion fields by a current estimate of the incremental cost, $g_l'(f^l)$, of a link through which said probe packet arrives at said node.

30. (Original) The method of claim **29** where each of said nodes through which a probe packet traverses modifies a second one of said congestion fields based on a

current estimate of the second derivative $g_l''(f^l)$, of said session congestion function of a link through which said probe packet leaves at said node.

31. (Original) The method of claim **30** where information received at said receiving end of said session from said second one of said congestion fields is employed to control said rate of said incoming traffic.

32. (Original) The method of claim **30** where said step of evaluating said session congestion measure employs information contained in said at least one congestion field of probe packets received in said incoming traffic and in said second one of said congestion fields.

33. (Original) The method of claim **1** where said step of evaluating said session congestion measure replaces a current value of said session congestion measure, γ_s, with a new value of said session congestion measure in accordance with $\gamma_s^{new} \leftarrow (1-\beta_s)\gamma_s + \beta_s \cdot \gamma_s^{(p)}$, where β_s is a selected constant that is less than 1, and $\gamma_s^{(p)}$ is the value of said at least one congestion field of a received probe packet.

34. (Previously Presented) The method of claim **1** where said step of evaluating said session congestion measure equates said session congestion measure to the value of said at least one congestion field of a received probe packet.

35. (Original) The method of claim **1** where said step of evaluating said session congestion measure is based on probability of packet loss experienced at said receiving end.

36. (Original) The method of claim **35** where said rate of said incoming traffic is controlled in accordance with

$$r_s \leftarrow r_s + a_s(r_s)$$

when there are no packets lost, and in accordance with

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$$r_s \leftarrow \max(r_s^{init}, \quad r_s - b_s(r_s))$$

when there are packets lost, where

$$a_s(r_s) = \varepsilon_s(r_s) \cdot h_s(r_s),$$

$$b_s(r_s) = \varepsilon_s(r_s)(1 - h_s(r_s)), \text{ and}$$

$\varepsilon_s(r_s)$ is a step size.